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inVALUABLE: Insect Value Chain in a Circular Bioeconomy

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Aim and Vision

inVALUABLE (Jan 2017 – Dec 2019) aims to demonstrate the potential of using insects to meet the increasing demand for protein in the food chain. The vision is to create a sustainable resource-efficient industry for animal protein production based on mealworms.

There are numerous by-products that may be used to produce insects; however, they are currently used as low quality feed, fertilizer or for biogas. Insects can significantly amplify the overall value of these resources through reintroduction as high quality feed/food.

inVALUABLE will touch upon a large part of the insect-supply chain and produce new data for use in development of insects as future feed and food.

The Insects

inVALUABLE focuses on two species of mealworms; the yellow mealworm (*Tenebrio molitor*) and the lesser mealworm (*Alphitobius diaperinus*). Both species are some of the most commonly used insects for feed and food today.

To optimize the production, inVALUABLE will focus on improving the overall understanding of mealworm biology. Moreover, new innovative technologies of automation and monitoring will be implemented to make the production systems more cost-effective and less labour-intensive.

Insects produced for food and feed in Denmark

In Denmark, there is no long history of producing and using insects as food and feed. The subject has received global interest over the last few years. As a major producer of pigs and chicken for domestic use and for export, Denmark is in an ideal position to explore insects as a novel source of nutrition for husbandry.

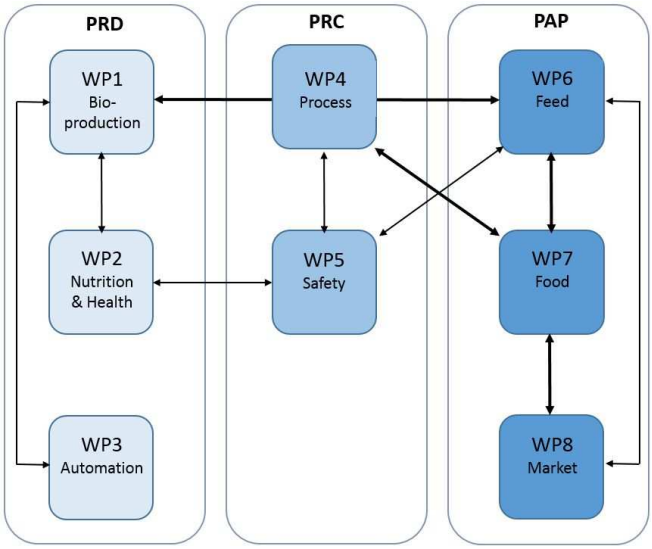
Concerning insects as food, there has recently been a dramatic increase in the interest among professionals, and the public shows an increased willingness to try insects as part of their diet.

The InVALUABLE team includes all major R&D groups in Denmark working on insects as food and feed as well as numerous partners from the private sector. As a result, we make up a national knowledge platform, and the project will over the coming years become the basis for national attempts to develop an industry based on insects. The teams have extensive international collaboration and include members of relevant international networks.

inVALUABLE

InVALUABLE will furthermore serve as a platform for students from many disciplines to perform experimental studies.

Project structure



inVALUABLE is divided into three focal areas – Production (PRD), Processing (PRC) and Product Application (PAP) – covering 9 work packages including project management

The focal areas and work packages

Production (work package 1-3)
Focus on optimization of the production of mealworms (WP1); improving the understanding of *mealworm health and nutrition* (WP2); and development of *innovative technologies* for implementing cost-effective production systems through automation and monitoring of mealworm health (WP3).

Processing (work package 4-5)
Develop processing methods of feeding substrates and insect biomass using different established and new technologies (WP4); and *assess the feed/food safety* of the obtained mealworm products as well as *regulatory advocacy* with relevant stakeholders (WP5).

Product Application (Work package 6-8)
Focuses on how mealworm can be *applied in feed and food products*. WP6 will assess and document the *nutritional and health* value of such products by the use of state-of-the-art animal models; including the recommended assessment method 'DIAAS' for protein digestibility. In WP7, *food application of mealworms* will be considered including focus on sensory of insect-based products; while WP8 aims at *influencing the market* and public perception of insects as food through a diverse dissemination strategy including focus on consumer acceptance.

inVALUABLE has a total budget of 3,9 mio EUR and is funded by Innovation Fund Denmark

www.invaluable.dk

Innovation Fund Denmark
RESEARCH, TECHNOLOGY & GROWTH